DOCTORS OF EARLY DAYS

Physicians Who Long Ago Regulated Health in the Capital.

A Time When It Was Bad Form for a Medical Man to Advertise His Calling—The Cholera Epidemic of the Year 1832—When the Druggists Were Regular Practitioners.

The health of the people of Washington, even in the early period of the city's growth, has never been neglected through lack of proper medical attendance. The natural conditions and of climate of this region were at one time forever the subject of considerable prejudice among inhabitants of northern localities.

In the year 1827 a citizen of Washington was debarred from a policy in any of the New York or Philadelphia life insurance companies, the prejudice in the north against regions as far south as the Potomac River amounting at that era to an almost positive dread.

In 1827 a table was prepared by the people of Washington, showing the percentage of the death rates of that city in comparison with those of Boston, Baltimore, New York, and Philadelphia. The average rates in these cities for the seven years ending with 1826, were as follows: Washington, 49.82; Boston, 41.45; Baltimore, 28.62; New York, 37.12; Philadelphia, 31.89. From the facts shown in this table it was suggested to the Philadelphia and New York insurers of lives that it would be advisable for them to omit from their policies the stipulation that the persons insured by them should not go so far south as the Potomac River.

The credit of improving the sanitary conditions of Washington, as well as that of ministering to the sick is due in no small degree to the excellent resident physicians which this city appears always to have had. The process of vaccination was introduced here as early as the summer of 1801, the President receiving some aura vaccina from Dr. Waterhouse, of Cambridge, Mass., with a view to having its effects tried. This first virus was given to Dr. Grant, of Georgetown, and was originally used by him.

When Physicians Advertised.

It was the custom in these primitive days of Washington for all physicians to publicly advertise. Thus on December 14, 1801, Dr. Tongue announced in the newspaper, that he practiced physic and particularly surgery. The advertisement further stated that he had been a private pupil of Dr. Rush, to whom he referred.

The first dentist to minister to suffering Washingtonians was Dr. T. Bruff, a man celebrated in his profession, and the inventor of the perpendicular extracting instruments. On December 28, 1807, the announcement was publicly made that Dr. Bruff had arrived in Georgetown, and that he offered his services to the ladies and gentlemen of the District.

Through the early files of the new papers can be traced the growth of medical practice in the city, but it would perhaps be rather difficult to locate some of the places mentioned without a map of the city at that period of their existence. Under date of October 2, 1805, Dr. Fenn announced that he had removed to the house opposite Mr. Morin's tavern. On April 21, 1806, it is learned that Dr. Starling Archer, late of the Navy, died on account of a wound received in a duel on the 17th of the same month. He was, it is said, universally esteemed, and his death lamented by all who knew him.

Dr. Briscoe, in 1806, was located a few doors west of the "Seven Buildings," in Pennsylvania Avenue, and kept at his house a supply of useful medicines and other articles needed by physicians. In January, 1808, the announcement was made that Dr. Lancaster had located in Washington, in Pennsylvania Avenue, and that he had several years' experience. In September of 1808 the celebrated Dr. William Grayson began the practice of medicine in Washington, locating two doors from Semmes' tavern, in Georgetown. Dr. Robert French, an eminent surgeon, began the practice of his profession in Georgetown May 1, 1809, and had his "shop" in the house then lately occupied by Dr. John Weems, deceased.

One of the most prominent practitioners of medicine in this city in the year 1812 was Dr. George A. Carroll, who resided in the corner house next door to the Van Ness mansion. The newspapers for the year 1815 are largely occupied by the advertisements of Dr. William Gardner, who professed to cure cancers, tumors, etc. Dr. John Ott, of Georgetown, died April 8, 1818. He was spoken of at the time as having had no superior "in every relation of life." He was, it was said, "a father to the poor, a friend to the distressed, and an example to others in the performance of every civil and social duty."

Dr. John Sinnott, A. M., a very celebrated physician, commenced the practice of medicine and surgery in Washington in December, 1825, with his office at Mrs. Sinnott's Academy, in Varnum's Row, in D Street. It was stated in his advertisement that he had fifteen years' experience in the various branches of his profession. Dr. Sinnott advertised in French as well as in English.

An Early Century Health Board.

In 1824 the members of the Board of Health were Drs. Thomas Sim, Henry Huntt, Thomas Sewall, Frederick May, and C. B. Hamilton. In January, 1825, there was reported a case of varioloid at Greenleaf's Point, in the city. The Board of Health instantly took measures to prevent the spread of the disease, and issued rules and regulations in the newspapers for the conduct of the people in respect to the case. Citizens were instructed not to have any intercourse with the patient, and the doctors and others attending on the infected person were not to mingle in society until all danger was passed. Vaccination was urged upon all who had not been vaccinated, the poor to be vaccinated free of expense by calling upon the physician of their ward. Dr. Henry Huntt was at this time the President of the Board of Health and Andrew Coyle secretary. There is no record that the disease in the instance above described extended beyond the one case mentioned. The first great necessity that came upon the board for the exercise of what appears to have been thought by many extraordinary powers was in connection with the cholera epidemic in 1832. The first death from cholera reported in Washington is described under date of August 10, 1832. Several deaths occurred before this time which were popularly supposed to have been due to cholera, but which the physicians ascribed to other causes. The case in point was that of a printer, about twenty-one years of age, who, after having been afflicted with dysentery for several weeks, was suddenly seized with cholera, and died in twenty-five hours. "This unfortunate young man," it was noted, "had been an habitual drunkard for four years, and for six weeks prior to his death had indulged in all manner of excesses, and had scarcely been sober during that time."

Plans to Stop an Epidemic.

In order to prevent the spread of this "great epidemic of the world," as it was then called, the Board of Aldermen and Board of Common Council of the city of Washington appointed six persons for the First, Second, and Third wards and four persons for the Fourth, Fifth, and Sixth wards, to serve as police commissioners and to be associated with the Board of Health for four months and the Mayor was authorized to appoint such additional number of scavengers as he might deem proper. The Board of Health, among other things recommended that religious bodies refrain from holding night meetings and resolved "that the vending of ardent spirits in whatever quantity, was a nuisance, and that, inasmuch as they had the authority to do any and everything necessary to preserve the health of the city," they ordered the discontinuance of the sale of such spirits for ninety days from August 14, 1832.

On August 16 of the same year the following proclamation was issued by the Board of Health:

"The board, after due deliberation, has resolved and do now declare that the following articles are, in their opinion, highly prejudicial to health at the present season. Believing them in the light of nuisances, they hereby direct that the sale of them, or their introduction within the limits of the city, be prohibited from and after the 22d instant, for the space of ninety days:

"Cabbage, green corn, cucumbers, pease, beans, parsnips, carrots, eggplant, cymlings, or squashes; pumpkins, turnips, water melons, cantaloupes, muskmelons, apples, pears, peaches, plums, damsons, cherries, apricots, pineapples, oranges, lemons, limes, cocoanuts, ice creams, fish, crabs, oysters, clams, lobsters, and crawfish."

This measure evoked a storm of opposition which the fear of the dread epidemic evidently could not quell. A writer, in a lengthy article published in the papers at the time, made certain very strong and intelligent objections to the regulation, claiming, in the first place, that neither the corporate authorities of the city nor the Board of Health possessed the legal authority to prohibit the sale of watermelons in the city.

"It would be right for you to exclude this article of trade," said the writer, "if it were certain, or even if good reasons existed to induce the belief, created by facts, that watermelons produce cholera. None such do, or can, or have been shown to, exist, except in the speculating honesty and contradictory theories of physicians. Before physicians can with safety say what is or what is not proper to be eaten during the prevalence of cholera, they must first know the disease and its cause. This they are perfectly ignorant of, and every opinion expressed by them is speculation and conjecture."

So great was the opposition to the decree of the Board of Health that a public meeting of the citizens was called at the City Hall, for the evening of August 21, "at 7:30 o'clock, to take into consideration the restrictions attempted to be imposed upon the productions of the earth and of honest industry by the despotic proceedings of the Board of Health of the 16th instant." The notice extended into quite a lenthy tirade against the so-called "despotic proceedings." The editors of the "National Intelligencer," the paper in which the notice appeared, were very careful to have it distinctly understood that they took no part in the controversy, because "it was not in their line." A public meeting of other citizens was also held at the City Hall to approve the regulations of the Board of Health.

It was stated in the papers that during the epidemic then raging only about half the actual number of cases had been reported. The greatest number of cases, it was said, had occurred in the square southwest of the General Postoffice. On September 1, 1832, Drs. Nathaniel P. Causin and Alexander McWilliams made a solemn appeal to the people to neglect no symptom which indicated an attack of the disease, stating that they had learned from experience that the preliminary symptoms, when taken in time, yielded to treatment by calomel and opium, followed by a gentle dose of castor oil, or rhubarb, or magnesia, but if the preliminary symptoms were neglected and a sudden and severe attack of the disease should supervene, more than nineteen-twentieths of those thus stricken must surely die.

On October 1, 1832, the cholera was believed to have disappeared, and on January 1, 1833, the official report of the cholera epidemic was made to the Board of Health by Drs. Henry Huntt, Thomas Sewall, and Nathaniel P. Causin. The entire number of deaths in the city from cholera, as given by this report, was: Males, 269; females, 190; total, 459.

Advance of Medical Science.

Medical science has been steadily advancing from the periods mentioned, and vast improvements have taken place in the classification of drugs, designs of surgical instruments, etc. A complete object lesson in the modifications in operating instruments and surgical methods of all kinds may be seen in the Army Medical Museum. This exhibit, which includes the latest appliances, as well as those dating from the period of the Revolutionary War, is of great benefit to local practitioners, who have an opportunity of studying here the most improved methods of their profession. Side by side with the advance in surgery and medicine is that of the indispensable adjunct of these professions, the pharmacy. There were but fifty-seven druggists in this city at the time of the civil war, while at present their number amounts to between six and seven hundred, while their practice is much facilitated. Thus, as a prominent druggist says, at the former period the compounding of a prescription might take an hour, owing to the crudity of the drugs, which today can be readily accomplished in ten minutes. There is need of less chemical knowledge on the part of the druggist of the present time, who was in early days very often an accomplished chemist and physician as well as a druggist or apothecary, as the signs over his store indicated.

The systematizing and preparation of drugs is now reduced to a very fine point, and the pharmacy becomes a ready and expedient adjunct to the field of the physician.

My Faith.

I trust in what the love-mad mavis sings,
And what the whitewed says whereso it blows,
And the red sorrel and the redder rose,
The power that puts the honeybee on wings,
And in its socket sets the rock, and rings
The hill with mist, and gilds the brook, and sows
The dusk, is on the wind that comes and goes,
The voice in thunders and leaf-murmurings.
I trust the might that makes the lichen strong,
That leads the rabbit from his burrow forth,
That in the shadow hides, in sunlight shines.
I trust what gives the one lone cricket song,
What ranks and hauls the wild-goose harrow north,
And snows the wild white on the silent pines.

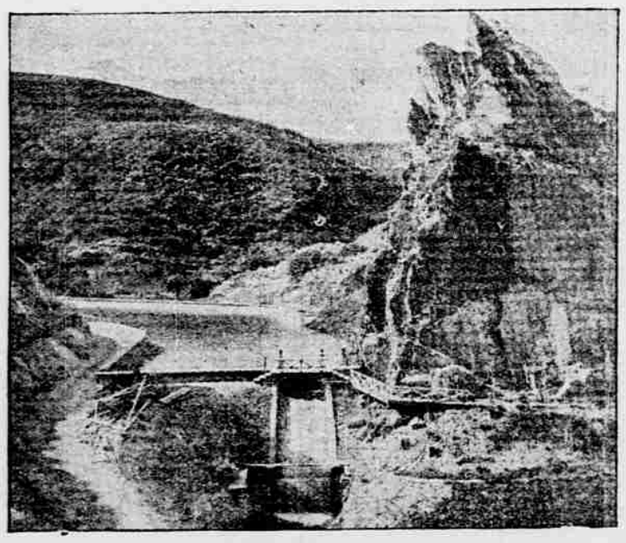
—John Vance Cheney, in the Atlantic.

IRRIGATING THE ROCKIES

A Part of the Region Deprived of Beneficent Rainfalls.

Clouds Full of Moisture Shut Off by the Lofty Hills in the Sierra Nevada Ranges—Artificial Means Devised to Enrich the Farms Lying East of the Pacific Slope.

With all the natural advantages to be found in the Rocky Mountain regions of this country, there is said to be one great drawback. This is the conspicuous lack of rainfall common to such States as Colorado, Wyoming, Utah, Idaho, and Montana. The Sierra Nevada and Rocky mountains act as bulwarks to the rain clouds which drift from the Pacific Coast, and prevent the moisture reaching the more easterly of the Western States. The settler in these regions seems to be dependent rather upon the earth than the clouds for the means of irrigating his land.



PARLEY'S CREEK RESERVOIR, UTAH.

In a report just issued by the Agricultural Department it is mentioned that the conditions under which agriculture is carried on in the Rock Mountain States differ radically from those prevailing in any other section of the country and have no small effect in altering the customs of the people, thereby raising new issues of national importance and placing a definite limit to the population which the region will support. According to the report the method of irrigation pursued is the basis of these peculiar agricultural conditions. The magnificent rivers throughout the country, with their tributary streams, form the source which is relied upon to furnish the farmer with the necessary means for the cultivation of his crops. But with the immense tide of settlers, it is found that the natural streams alone will not accomplish this purpose. It is found necessary to foster and preserve the bounteous gifts of nature at one season, in order to provide for the drought which prevails when the rivers are at their lowest ebb by the building of artificial reservoirs, which, placed at convenient locations, receive and distribute their supply by means of the rivers themselves and canals.

This system of artificial water supply has its advantages and its disadvantages. The farmer who locates in the Rock Mountain region has first to establish his water-right claim, and the neglecting of this may cause him considerable trouble during his future occupation of the land. The priority of the various water rights and the volume of water of a stream are determined in the Rocky Mountain States by court decrees or (in Wyoming and Nebraska) upon the orders of the boards of control. The enforcement of these rights of priority and the distribution of water under them is accomplished by water commissioners, or water masters, as they are called.

Policing the Water Sources.

That this supervision of the distribution of the water may be effective, it is found necessary to police and patrol the streams from which it is obtained. To this end it becomes the duty of the water master to examine and regulate the headgates of all ditches or other conduits by which water is diverted from the stream or streams under his charge for the purpose of determining that each claimant receives the volume of water to which he is entitled under his decreed priority of right. During the spring season, when the streams are in flood and before the work of irrigation is in active progress these duties are comparatively simple, since, at this time, there is generally enough water for all claimants, and hence no call for anyone taking more than his due share; but when the floods have subsided the streams resume their normal level and the soil is parched for want of moisture, then the water master's work becomes complicated and his lot is frequently not a happy one.

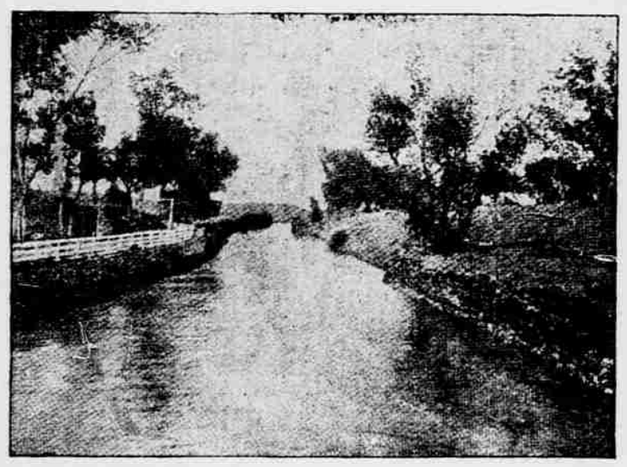
The complicated system of water supply, with the various legal questions involved, together with the vast engineering enterprises which have made it possible, has grown from the small ditch of the pioneer settler. The pioneers, having selected the ground which they meant to occupy, constructed each his own ditch for the irrigation of his farm and collected there from some neighboring stream the water needed for his purpose. Even at the present time the instinct of the settler leads him if possible to prefer this independent method to the enforced submission to regulations, which dependence on partnership ditches or canals involves. The settler, however, is compelled to seek for such opportunities far from civilization, and the building of individual ditches is said to be largely a thing of the past.

The sysem of artificial irrigation, with all the complexities it involves, depends primarily upon the law of gravity. The point at which the stream is tapped, being higher than the field to be watered, sends the water down through a channel to a ditch in the highest part of the farm. When it has thus been brought to a level with the most elevated points upon the tract to be irrigated, it can be made to flow out over the land without any assistance from the irrigator beyond such manipulation as may be required to effect its uniform distribution over the minor irregularities of surface, which latter are usually provided for before irrigation is attempted.

While nature's law in this instance is identical in effect with the requirements of the farmer, it cannot be said in every case that there is a like agreement. It unfortunately happens that the rivers are at their lowest ebb when the water is most needed by the settlers. Hence the problem of artificial irrigation deals with the question of storing the surplus of one season for the deficit of the other. It is said that the solution of this problem in its practical and universal application is only being begun in the far Western region.

Damming the Canyons.

In several places, however, lofty and expensive dams have been built across the canyons of mountain streams, such as the Parley's Creek Reservoir, Utah. The perfecting of such works requires the construction of a canal to fill them and of outlets for drawing off the water and transporting it to the land to be irrigated. Many natural basins are found in the form of a great bowl completely enclosed on all sides, so that no dam or embankment is necessary. In such cases, there has to be constructed either an open cut or a tunnel through the surrounding rim, through which a pipe or some other form of conduit is placed for drawing off the water whenever it is required. Many of these reservoirs are at present in course of construction, and arrangements are being made for a gigantic and complete system of water supply. This will, according to agriculturists, prove a great boon to the farmers, but it will also, it is said, lead to many complications. It will greatly increase the difficulty, now largely felt, of dividing the water among the different claimants to a common supply and will make it necessary to have additional legislation to define the character of the rights to these stored waters. The benefits which have already accrued from the construction of reservoirs have so far been most gratifying, but their improvement and operation has also added largely to the annual cost of water and the settlers show a decided preference to the canal with an early priority right. Nevertheless the necessity for the reservoir and an adequate system of stowage is universally felt throughout the Rocky Mountain region, and the opinion is almost universal that the extension of the system will prove an immense benefit to the agricultural interests of that section of the country.



AMITY CANAL, ARKANSAS VALLEY, COL.

EMPRESS AND PRESIDENT.

The Russian Catherine and the American Washington.

(From the Kansas City Star.)

It is Max Muller who has revived the circumstance that Catherine, sometimes called the Great, and George Washington were contemporaries—in fact, were rulers of great countries at the same time. The Empress Catherine was a friend to Washington, before Washington was in a situation to be a friend to her. She was on his side during the American Revolution. There is a story to the effect that old George III wrote her once offering $100,000 for soldiers whom he wished to hire after the manner of the Hessians and the Brunswickers, but the Empress never answered the letter. So our forefathers never had any Cossacks on their backs in their struggle for independence.

When Washington was President, the Empress Catherine, who was a scholarly person, educated after the German manner, had on hand the plan of a universal dictionary. She wished to secure the verbal equivalents of several hundred Russian words in the aboriginal languages and dialects of America, and sent her lists to Washington. He in his turn obligingly sent words forwarded by the Empress to Governors and commanding officers among the Indians and requested that Catherine's wishes be complied with. Some affect to see in this exchange of civilities the beginning of our national good understanding with Russia, which has lasted over an hundred years.

The points of life and character between George Washington and the Empress Catherine were certainly widely different, and yet the opportunities which they enjoyed were not dissimilar. Each was at the head of a young nation.

The new Russia which the great Peter had evoked from unknown barbarism, was not so very much older than the United States of America, of which Washington was the first President. Russia was still new when Catherine came to the throne. Catherine realized this and invoked the help of French and Germans to aid in polishing the rudeness of the material with which she had to deal.

Much of the work, too, of Washington was of a formative character. He was President for eight years and then went back to his plantation at Mount Vernon, with no more power than any other citizen, but while he had the opportunity he did what he could to promote the welfare of his country. Yet how different the results which followed the labors of the two rulers.

Catherine extended the borders of Russia, set up institutions of various kinds, said to the Russians, "Be witty and polite like these Frenchmen, thorough and learned like these Germans," but she died and left Russia where slavery did not stop with serfdom and with a load of ignorance which still bows the country down.

Washington, however, fought for the independence of his country, took part in steps to give it an organic union and a constitution which was the base of government, and was chosen by the people its Chief Magistrate. He accepted the rule he had helped himself to make, that a country should first be free and then should make itself. So the two nations have kept on, the absolute monarchy and the free republic; the land of Catherine and the land of Washington.

The land in which Catherine's will was law, until it was time for her to go to her own place, and some other to come and make law, exists, larger grown, but a great sufferer from ignorance, from a costly army, almost constant famine and depopulation.

The land that Washington left with liberty has made its way with that priceless heritage. Millions have left the Old World and joined to it their fortunes. Education has assumed charge of the generations as they have advanced. Every form of modern progress has been made, and room has been provided for thousands of Russians unwilling to submit to the transmitted tyranny of Catherine. Thus is Liberty justified.

FISH CULTURE IN AMERICA

Wondrous Work Accomplished Under Government Auspices.

Seine Hauling Scenes Along the Potomac River—Cultivation and Preservation of the Finny Tribe—Shad Matured in Glass Bottles and Then Set Free to Enrich the Streams.

Not among the least attractive of the thousand-and-one attractive features in Government structures located in the Capital is the aquarium at the Fish Commission building, where scores of curious denizens of the lakes, bays, and rivers disport themselves and are apparently as happy in their artificial homes as they are in their native element. The aquarium is certainly worthy of the attention given it by scores upon scores of callers. The casual visitor is likely to devote more attention to the cases with their full-grown occupants of varied hues than to the unpretentious-looking jars containing the eggs or embryos, of which there are a few specimens in the aquarium. These represent the real utilitarian work of the commission, namely, the cultivation and preservation of the many kinds of fish that inhabit our waters, and are worth inspection. The eggs are covered with a transparent shell-membrane, through which the eyes of the embryo are plainly visible, and are kept in constant motion by a mechanical arrangement connected with the breeding jars. The Fish Commission is entitled to the gratitude of all lovers of those edible delicacies furnished by sea, lake, or stream throughout the country, for it is owing to its efforts that many varieties of the most valued fish are supplied to the table.

Propagation of Fine Fish.

"The product of the shad fishery is today as much the subject of artificial control as the corn crop," said the Hon. Marshall McDonald, former United States Commissioner of Fish and Fisheries, and no other statement could convey more clearly the scope and utility of the work being carried on by the Commission. But the shad is not the only fish which has been saved from practical annihilation through its efforts. The whitefish of the Great Lakes and the salmon of the Pacific Coast, both of which varities are so abundant today, were a short time ago becoming almost extinct, but the methods adopted for their preservation were so successful that we may look upon a continual perpetuation of these delectable fish. Through the efforts of the bureau, also, hundreds of streams throughout the country which had been rendered practically barren by reckless overfishing have been restocked and restored to a condition of productiveness, often very much greater than had ever before been known.

An illustration of the methods of the Commission in caring for the fishing industry of the country is furnished in the vicinity of this city where the Potomac shad comes in for its full share of attention. Sixteen miles down the Potomac from the Capitol, nearly opposite Mount Vernon, and almost under the walls of old Fort Washington, is the Bryan's Point Fish Commission station. A line of tents on the grassy banks, with the American flag floating overhead, might perhaps convey the impression of a military camp did not the occupations of the men upon the beach effectually dispel the illusion. The scene presented by this camp of the "gentle craft" upon a quiet spring morning, when the seine is being hauled, is exceedingly interesting.

The Maryland hills, covered with new foliage of a hundred shades of green, form a background for the tents, fortified as they are with the white pump house and hatchery, and the old boat house and seine haulers' quarters. An occasional market sloop, or a pungy floats slowly past on the early tide, or comes to anchor near by to wait for the seine haul. The water, struck by the first beams of the rising sun, breaks into countless diamond sprays from the oars of the seine boat as it dashes away from its capstan with the net playing out from the stern. As it reaches midstream its path is marked with a dotted line of corks which expand into a vast semi-circle as the boat brings in again and makes fast at another capstan some hundred yards below the point from which it started.

Now commences the work of hauling in the net. The crew tumble out into the water, thigh deep, and, wading ashore, make fast the hauling line to the capstan, which is worked by a team of horses. Soon the shore end of the great net comes in; then boot tops are hauled up and all hands wade out and lay hold. Long lines—quarter lines they are called—have been made fast to the seine far out in the river and are wound in while the men are hauling. Gradually the space within the line of corks is narrowed as the net comes in, until at last the agitated water and the occasional silvery gleam of a jumping fish tells of the living load with which it is weighted. The men gather in closer and the fish come to view in a glittering mass of beauty. They are quickly transferred by dip net from the seine into the lighter, where they are sorted.

Separating the Catch.

As soon as the herring are separated from the shad, the latter are examined for those that are to be taken into the nursing hospital, and it is here that the Fish Commission assumes the role of guardian.

The process of securing the eggs of the fish is not by any means difficult, though great care is necessary in preserving their vitality. In less than forty-eight hours they are ready to be conveyed to the Central Station at Washington, where the hatching process is completed.

Along the Potomac for many miles below Washington every spot adapted to seine fishing is swept at ebb-tide, the banks being dotted with the camps of the gill-net fishermen, and hundreds of trap nets lay in wait for the unfortunate fish. Every day during the fishing season a steam launch leaves the station at Bryan's Point with seven small boats in tow, which are dropped at intervals of two or three miles down the river. Each of these boats is provided with the necessary paraphernalia for handling the fish and securing the eggs, for which the proprietor of the net is paid by the Fish Commission 20 cents a thousand.

Millions of Eggs Secured.

Sometimes the number of eggs taken in one day will be as high as eight millions—no easy matter to count, were the counting actually done, but a sufficiently accurate estimate is made by measuring the depth of the eggs in the jars, it having been previously calculated just how many occupy a given space. After a day and a half in the jars at Bryan's Point, the eggs, which a fall of rain would have destroyed by rupturing the delicate shell membrane, have become strong enough for packing on the trays for shipment. The shipping tray is simply a light wooden frame, eighteen inches square, across the bottom of which is stretched a netting of wire. Over this is laid a wet cotton cloth, and the eggs are carefully dipped from the pan into which they have been emptied from the jars, and spread out in two layers. The trays are stacked one upon another, and the whole is then enveloped in another wet cloth and securely strapped, ready for transportation. Thus packed they will live for two or three days, ample time for shipment to a considerable distance, and require only to be kept moderately wet and cool. Arriving at the Fish Commission building in this city, they are washed from the trays into the hatching jars again, and these are immediately put in operation.

The hatching apparatus, which is the invention of former Commissioner McDonald, is the result of a long series of experiments, and is simple and effective. It consists of a round glass jar with a hemispherical bottom, provided with a screw top, having apertures for the admission of two glass tubes, one to supply the eggs with a constant flow of water, the other to carry off the overflow, and a small tank or aquarium for the reception of the young shad as they are hatched. The supply tube extends to the bottom of the jar and the water, rising to the exit at the top, keeps the mass of eggs in constant circulation, or what has been best described as the "boiling motion," bringing each egg in succession to the top. It is a property of the dead eggs that, once they reach the top of the mass, they will not again mingle with the others, so that they gradually accumulate in the upper portion of the jar, whence they are removed by simply pushing down the exit tube until they are carried off with the overflow. Eight or twelve of the jars are arranged round one tank and furnished with water from the general supply pipe at the rate of about two quarts per minute. Each jar holds six quarts and has a capacity of over 100,000 eggs, though usually containing about 85,000.

So transparent is the egg, and so rapid is the development of the embryo fish when once started, that, with close and systematic observation, the whole series of changes may be plainly observed in the one individual, until it bursts the delicate membrane and emerges into free existence. These eggs afford perhaps the greatest facility in all nature of observing the process of germinal life in the fish kingdom. As already stated, the spectator first discerns little more than two very bright eyes in the little globular mass, but, upon closer inspection, two or three faint, shadowy, dark lines are observable, coiled half round the interior of the egg, marking the position of the body, which at this stage is nearly as transparent as the surrounding water. The fish has acquired considerable power of movement by the time the eyes have appeared, and at strikingly regular intervals of about one second gives a vigorous wriggle. A few hours later, or at about the end of the third day after being placed in the jar, a movement of more than usual strength will rupture the frail prison and set the fish, as it should be called at that time, free.

Transferred to New Quarters.

The infant fish does not long enjoy his original quarters, but is carried into a receiving tank, whence he is transferred, with his fellows, into tin cans for distribution. It is found necessary to effect this at once in the case of the Potomac shad, for, unlike many of the species handled by the Fish Commission, the trout, the salmon, and the bass, for example, the shad cannot be reared to maturity in confinement. He must soon be turned loose to find his natural food and to make his way at the end of summer to the sea, his proper home. The shad belongs to that class of fishes called anadromus, which ascend the rivers and estuaries at certain seasons, returning again to salt water.

The distributing cans contain each about thirty thousand fry, and are sent by rail to various points on the coast. They are there emptied into the mouths of rivers, and attain in the course of the summer a length of two or three inches.

Thus is the work of the Fish Commission exemplified in the case of our Potomac River shad, and thus are handled during the course of each year between seventy-five and one hundred millions of them, but this is only a small item in the entire work of the bureau. The process of stocking waters with indigenous fishes is carried on from stations situated all over the country, and the result is the steady increase in the value of the fisheries where an equally steady decrease had previously been the rule. More striking results, however, have followed the introduction of species into waters of which they are not natives, as that of the shad into the Pacific Coast regions. In 1871 the California State Fish Commission planted twelve thousand of these fish in the Sacramento River with good result. The enterprise was then taken up by the National Fish Commission, with the result that the species is now found along the entire coast as far north as Alaska. The value of the fishing is something enormous. The planting of striped bass in the waters of the Pacific, though on a smaller scale, has met with a like success, and many more instances of the same nature might be adduced.

The Government of Canada is said to be the only one in the world to carry on operations of a magnitude in anywise comparable to those of the United States Fish Commission, but the European governments are gradually taking the matter in hand. As a pioneer the American Fish Commission has benefited the entire world, while its value to this country is recognized as inestimable.

HOW MOTORMEN KEEP WARM.

New York Trolley Drivers Wear an Armor of Wool.

(From the New York Commercial Advertiser.)

On the general principle that there are enough things to worry about without the addition of undeserving cares, it is perhaps in order to assure the kind-hearted that most of their sympathy for street car motormen, exposed to cold and storm, is misapplied. As a rule, standing out for several consecutive hours through an assorted lot of New York's winter weather is conducive to a strong inclination to get under shelter somewhere, but in judging of the sufferings of certain working classes allowances should be made for distinct circumstantial factors—viz., hardiness of the men and their acclimatization. Go to the motormen themselves, and hardly a man will be found who says that he suffers from the cold.

"We don't get cold," said one man. "Of course, we would if we didn't wrap up; but with these thick clothes we're all right. We get the full benefit of the weather on the front platform, and on the very cold and windy days it strikes pretty hard, but there's a lot in getting used to it."

In starting in as a motorman a new employe has to supply himself with a regulation heavy blue overcoat, weighing about fourteen pounds and costing $14; a heavy pair of blue trousers, and a cap which may be pulled down over the ears, the entire outfit costing a little short of $20. Those must be paid for by the man before he is placed on a car. When it was suggested to an old hand that this regulation might come hard on some candidates, he said with dignity that motormen were "not such a poor class as all that." Coverings for hands and feet are not prescribed, but all those "who know their business," as the old motorman said, supply themselves with heaviest procurable boots and generally goloshes to go over these on wet and cold days, and heavy mitts given an extra lining of wool at home. New men sometimes buy gloves, but these do not prove as warm as the mitts, where the fingers are together.

The motorman does not dress on cold days—like the tenderfoot spending New Year's in the country—with two waistcoats, a sweater, and innumerable mufflers. He generally dresses at all times uniformly, varying his protection by turning up his collar and pulling down his cap. Underneath his weighty outer covering, he wears only the usual number of garments, and these of ordinary heaviness, with the exception of an extra heavy suit of underwear. Thus the runner of the surface cars wears an average thickness of about eight inches of clothing. Behind this there is an inflexibility of nerves and a vigor of circulation that the housed civilian might have for his constitutional ideal. And this is the one real reason why the motormen do not suffer at their work.

From the men themselves it is found that the final selection of motormen is a matter of survival of the fittest. Most applicants for the work are men who have always been accustomed to outside work. They know their job. The first day out they have supplied themselves with the complete eight-inch costume, and they merrily dance about a bit on one foot and then on the other when the wind gets keen. Less hardy men unused to outdoor work, trying this, often, because they need employment, have to learn their job, and most often learn that it is not for them. They generally start in under-clad and are forced to dance to keep warm in a way that resembles work, but they are soon knocked out—within a few days—while their hardier competitor simply continues his occasional jigging as the wind turns his nose from red to purple and from purple to white.

MISSION WORK IN MANILA

Christian Expansion Follows America's Territorial Growth.

Methodists and Episcopalians First Among the Protestants to Establish Churches and Schools in the Philippine Islands—Purchase of a Fine Building for the Y. M. C. A.

Long before the guns were silent on the firing line in the Island of Luzon all of the principal religious bodies in America were represented in the Philippines. Christian expansion let no grass grow on the road that was lately made by American political expansion. There was haste, but, to the credit of the Christianity of today, it needs to be recorded that there was not unseemly haste. President Schurman, of the Philippine Commission, wonders whether there might not be presented to the Filipinos one, and not many, forms of reformed Christianity. It may not be possible to obtain this ideal, but among the religious bodies from America which have begun work in the Philippines there comes nearer to being an amicable understanding than it was ever possible to bring about before.

There is to be held in New York at the end of the coming April a conference on missions. It is an ecumenical one, in that it represents the whole Christian world. It is coming together to see how President Schurman's suggestion may be carried out. It does not come solely for that, of course, but it is certain to push on the progress in that direction that is unmistakably making.

It is not yet quite determined what religious body, as such, first began services in Manila—barring, of course, the one that has been there for three or four hundred years. Methodists and Episcopalians began at almost the same time. One was helped by the fact that Bishop Thoburn, the Methodist missionary Bishop of India, was near by, and could reach Manila without much delay, and the other by the fact that an active chaplain, an Episcopalian, took up the service of the Book of Common Prayer, not as a chaplain, but as a member of the American Episcopal Church.

The very first representatives of American Protestant churches to reach the Philippines were Young Men's Christian Association secretaries, who went from San Francisco on the first transports to carry troops thither. They took with them tents and Bibles, literature, and singing books, and they are still there, prosecuting a successful work. They have been joined by ten additional men, and in the lack of chaplains they are performing service for regiments which the Government ought itself to provide. One of the landmarks of Manila has come to be the Association tent near the Bridge of Spain. Crowded beyond its capacity, the Government loaned a building nearer to the Quartel del Fortin. Now a property has been purchased, and is being converted into an Association building of the usual pattern. The price paid for the property was $6,000. The association holds services at Cavite and upon the men-of-war anchored there.

Methodists began to hold a service in the Filipino Theatre, and another in the Ermita district of Manila. Now they have organized two churches. Both are mainly for Filipinos, and both have services and sermons in Spanish. There is a school for girls, and Bishop Thoburn, to whom the care of the work has been committed, hopes to have a school for boys in due time, besides a medical dispensary. Two missionaries supported by the Missionary Society of the Methodist Church, are on the ground.

On decoration day last the Mission of the Holy Trinity was started in Manila, although Episcopal services had been held in the city since the beginning of that year. The Brotherhood of St. Andrew took the lead in this effort. Holy Trinity Mission has now two clergymen and one layman, and attached to it is another layman who has had a tent and done work similar to that of the Young Men's Christian Association. The Mission has a typical eastern building of the Spanish type, and is located in the midst of barracks. The lower part is fitted up as a chapel, the upper part as library and writing and meeting rooms. Many officers of the army and navy attend services here.

Presbyterians have four missions in Manila and are to establish a fifth. They helped the Young Men's Christian Association by providing preachers for its tent services. In the middle of February authority was sent to organize formally and legally one of the Presbyterian missions into the First Presbyterian Church of Manila, and steps were taken to start work in Iloilo. Some native Filipinos have been baptized by Presbyterian missionaries, and among them is a little child who is as yet the only infant Filipino that has been baptized in the islands in the Protestant faith.

Baptists are to undertake work in Iloilo, but have not yet done so. Disciples of Christ have opened a mission in Manila, and have started a school. Congregationalists will not go there, but are to confine their efforts to Guam and other Pacific islands, their purpose being to line the route from Honolulu to Manila with Christian mission stations.

Before this work was started by these different American religious bodies, conferences were held by those in authority, and in the Philippine work an effort is making toward real comity. Comity in mission work will be discussed at the Ecumenical Conference already referred to. As everybody in charge of missions will be present to hear, a larger number than ever before, it is believed that some definite step will result. Christians of all bodies, their leaders, at any rate, say they want no waste of mission funds, and they have proved their professions by their works thus far in our new Far East political territory.

A SOLID MAN.

The Unsainting Style of a Traveler on the Highway.

(From the Detroit Free Press.)

"Take a look at that man." The head of the house had just returned from the kitchen and was talking to an old friend whom he had left in the library. "Notice his carriage; head well back, step firm, shoulders squared, and his whole air suggestive of important business. They just called me to see him. As a result he has a half dollar of my money, a hat and an overcoat that is yet good for a season or two."

"Told a sad story, I suppose?"

"Not specially sad, but it's his whole manner. He has the composite spirit of the world. It is not one man in twenty that gets better than a curt dismissal from the woman in the kitchen. She declares that she can tell from a knock what kind of a man is giving it. If it be nervous, timid or vacillating, 'stammery,' as she calls it, the applicant is sent about his business before he can get his breath. All the servants turn up their noses when they hear that weak and fluttering request for an admission.

"But this fellow swung around to the rear as though he was going to storm the castle, gave a bold, audacious knock as if with the hilt of a sword, stepped inside as the door opened and asked in a commanding voice if the man of the house was at home. 'Don't disturb me till I get warm,' and he pulled a chair to the side of the range, put his miserably shod feet into the oven and asked if he could glance over the morning paper. The pie smelled like the pie he used to get at home, and they gave him a generous section to sample. He praised the roast till he got a slice, told the cook that she ought to set up as an exclusive caterer, and then asked for me. He did not whine or cringe but talked just like a solid business man, looked me straight in the eyes and captured the goods and chattles I've mentioned. That chap knows the world and can live easier without work than you or I can with it."